Field Sanitation Team Certification Course

LESSON 4 - WATER SUPPLY IN THE FIELD

FSTCC0004-1

Lesson Objectives

- Match a list of terms related to water treatment with a list of corresponding definitions.
- Identify the importance of water in the practice of sanitation.
- Determine the required quantity of potable water for a unit.
- Match a list of organizations with their respective responsibilities for the production of potable water in the field.
- Identify the rules of water discipline.

Lesson Objectives

- Determine the best water source based upon the unit's situation.
- Identify water treatment processes used in the field.
- Demonstrate the knowledge of the steps for inspection of a 400- gallon water trailer.
- Demonstrate the knowledge of the steps to perform chlorine residual monitoring.
- Demonstrate the knowledge of the steps to disinfect water in the field.
- Monitor bottle water operations.

Definitions

- ***Palatable Water -*** *Water that looks, smells, and tastes good.*
- ***Potable Water -*** *Water that is fit for human consumption.*
- ***Water Treatment -*** *Procedures that are used to change the chemistry of water to improve its quality.*

Definitions (2)

- ***Disinfection - A process of killing infectious agents outside the human body by direct exposure to chemical or physical agents.***
- ***Chlorination - A treatment process that combines the water with chlorine or chlorine compound.***
- ***Chlorine Dosage - The total amount of chlorine or chlorine compound added to a given amount of water.***

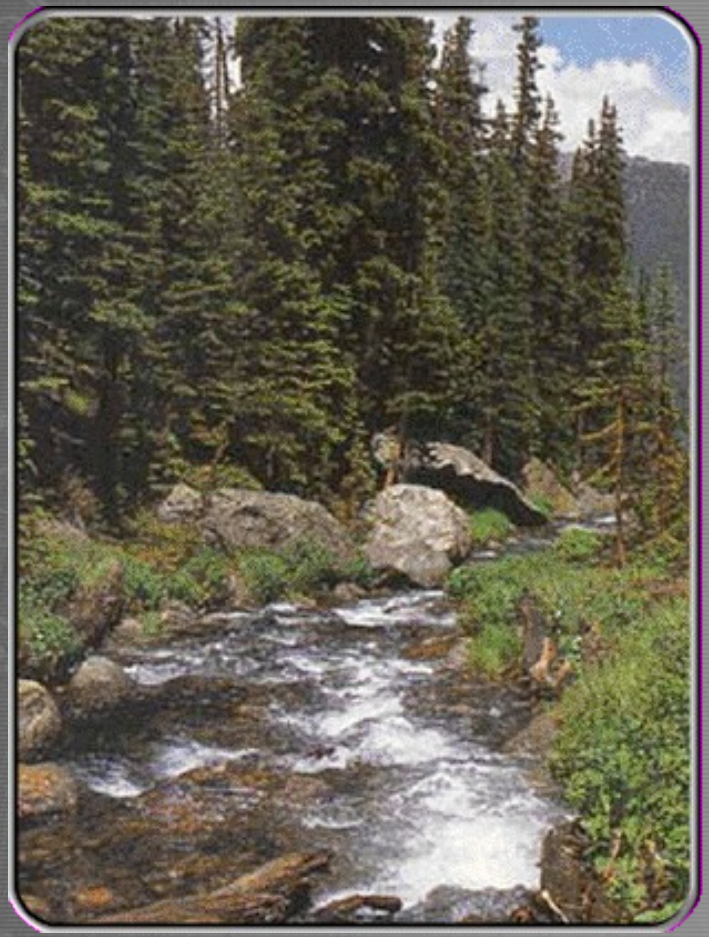
Definitions (3)

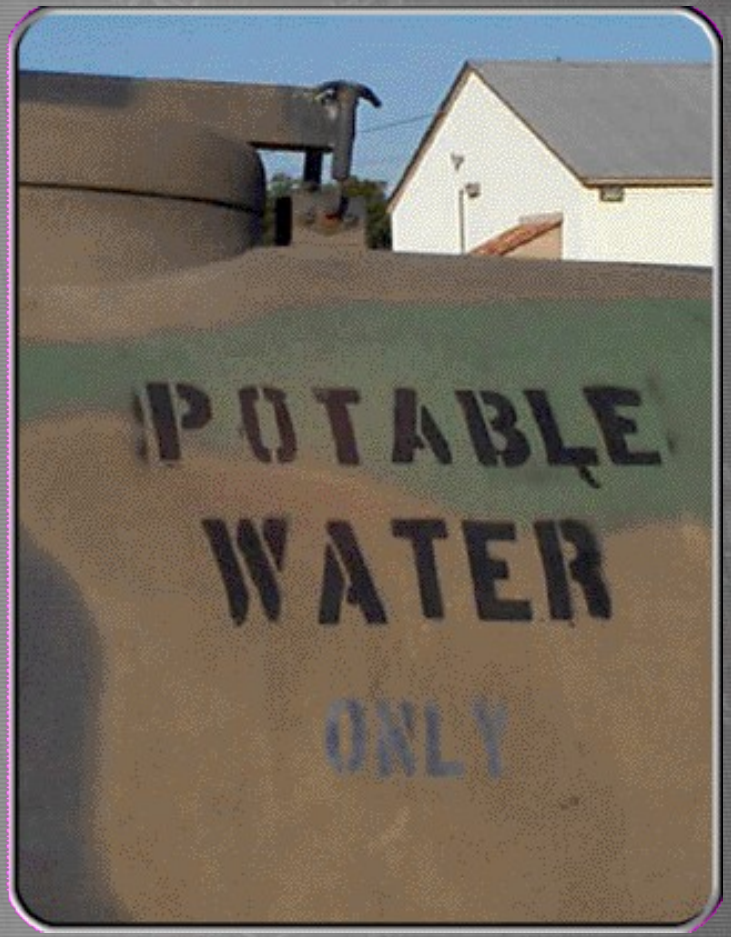
- ***Chlorine Demand -*** ***The amount of chlorine dosage used or consumed by substances in the water.***

- ***Chlorine Residual -*** ***The amount of chlorine left in the water after the chlorine demand has taken effect.***

- ***Parts per Million (PPM) -*** ***The parts of chlorine present in a given volume of water (concentration). (This value may also be expressed in Milligrams per Liter (Mg/L).***

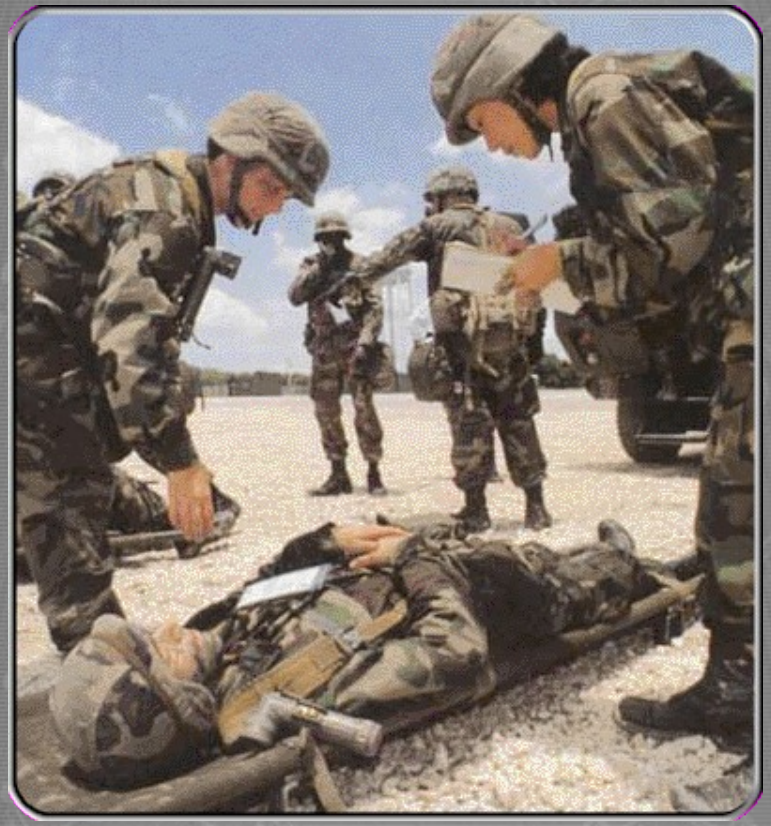
Water Supply in the Field





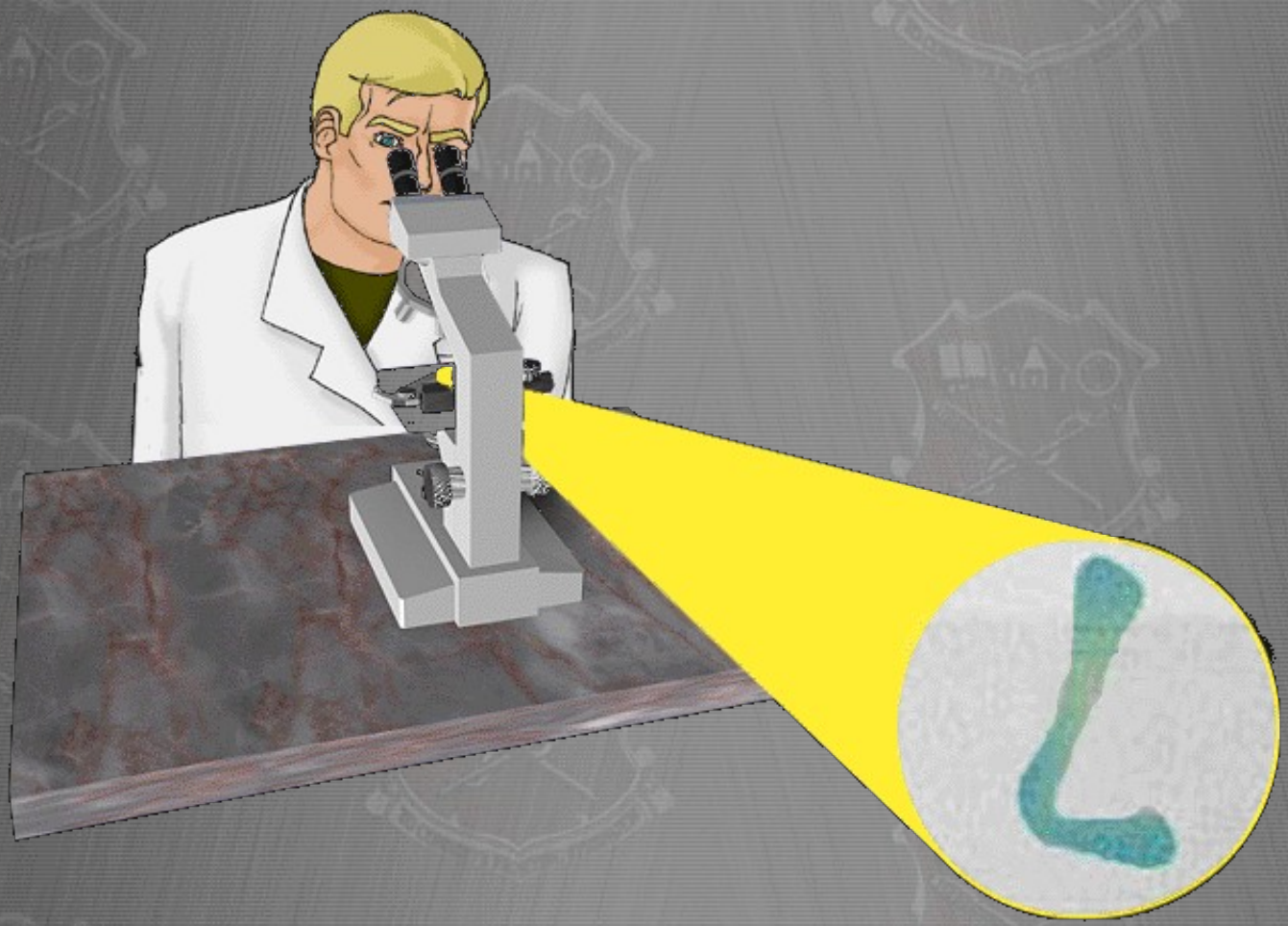
- Safe water is essential.

Disease Transmission



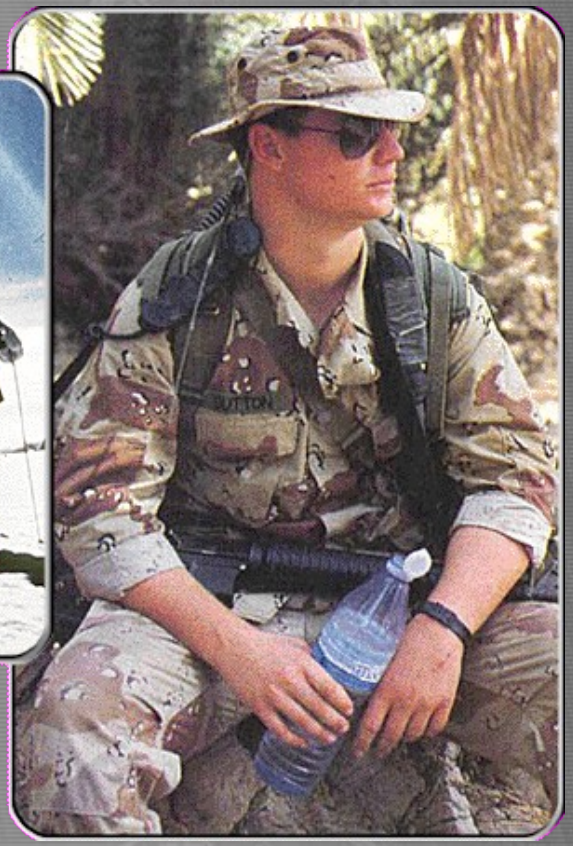
- *Water-borne bacteria are a contributing source of disease to soldiers in the field.*

Bacteriological Testing



- Testing is the best indicator that contamination exists.

Water Requirements in the Field



- *Water requirements vary with the seasons, the geographical location, and the tactical situation.*

Quantity of Water Required for Soldiers

General Planning Guidance

- Cold Climate- Only 2 gallons (7.75L) of water per soldier per day may be required for drinking purposes even if engaged in physical activity.
- Hot Climate- 3 or 4 gallons (11.355 to 15.14 L) per man per day may be required when engaged in only sedentary duty.
- Arid Zone-3 to 6 gallons (11.355 to 22.71L) per individual per day. Shower facilities increase requirement to 15 gallons (56.775L) or more.

Army Medical Department Responsibilities

- Performs bacteriological testing; advises authorities on water purification methods.
- Establishes safe water standards, inspects water points, approves water for consumption.

Corps of Engineers Responsibilities

- Selects water sources.
- Establishes water points.

Quartermaster Corps Responsibilities

- Sets up and operates bulk water treatment equipment.
- Procures, treats, distributes treated water.

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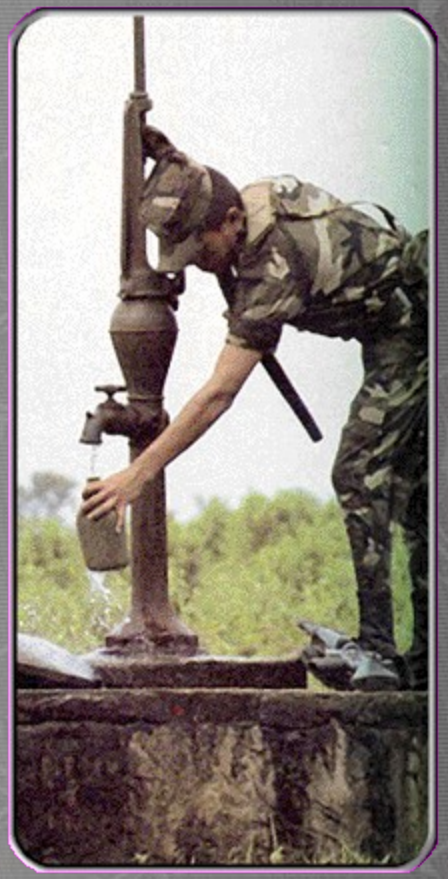
Unit Commander Responsibilities

- Ensures adequate water supply in the unit.
- Monitors water treatment processes.

Rules of Water Discipline

- Drink approved water only.
- Prevent water waste.
- Protect water sources with good sanitary practices.



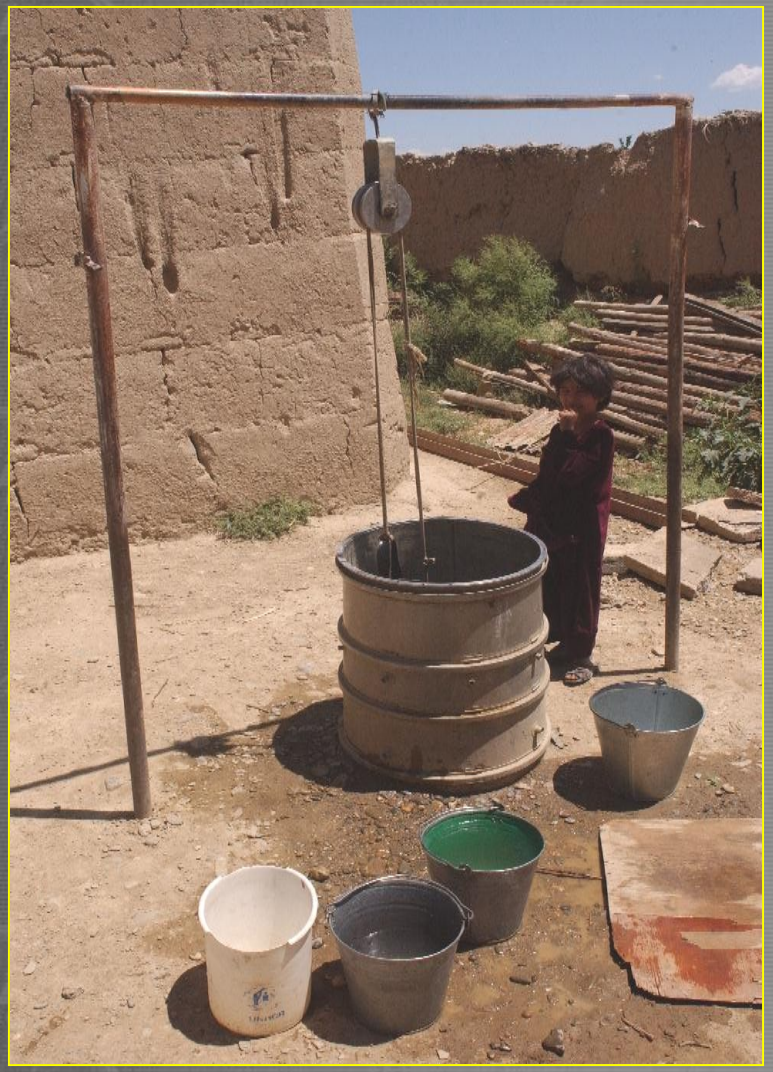
Sources of Water

- *In an emergency, the FST may be called upon to select a water source.*

Surface Water

- Includes streams, ponds, rivers, and lakes.
- Most commonly selected for use.

Ground Water



- Includes wells and springs.
- Quantity difficult to determine.
- Costly to obtain.

Rainwater, Ice and Snow

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Seawater

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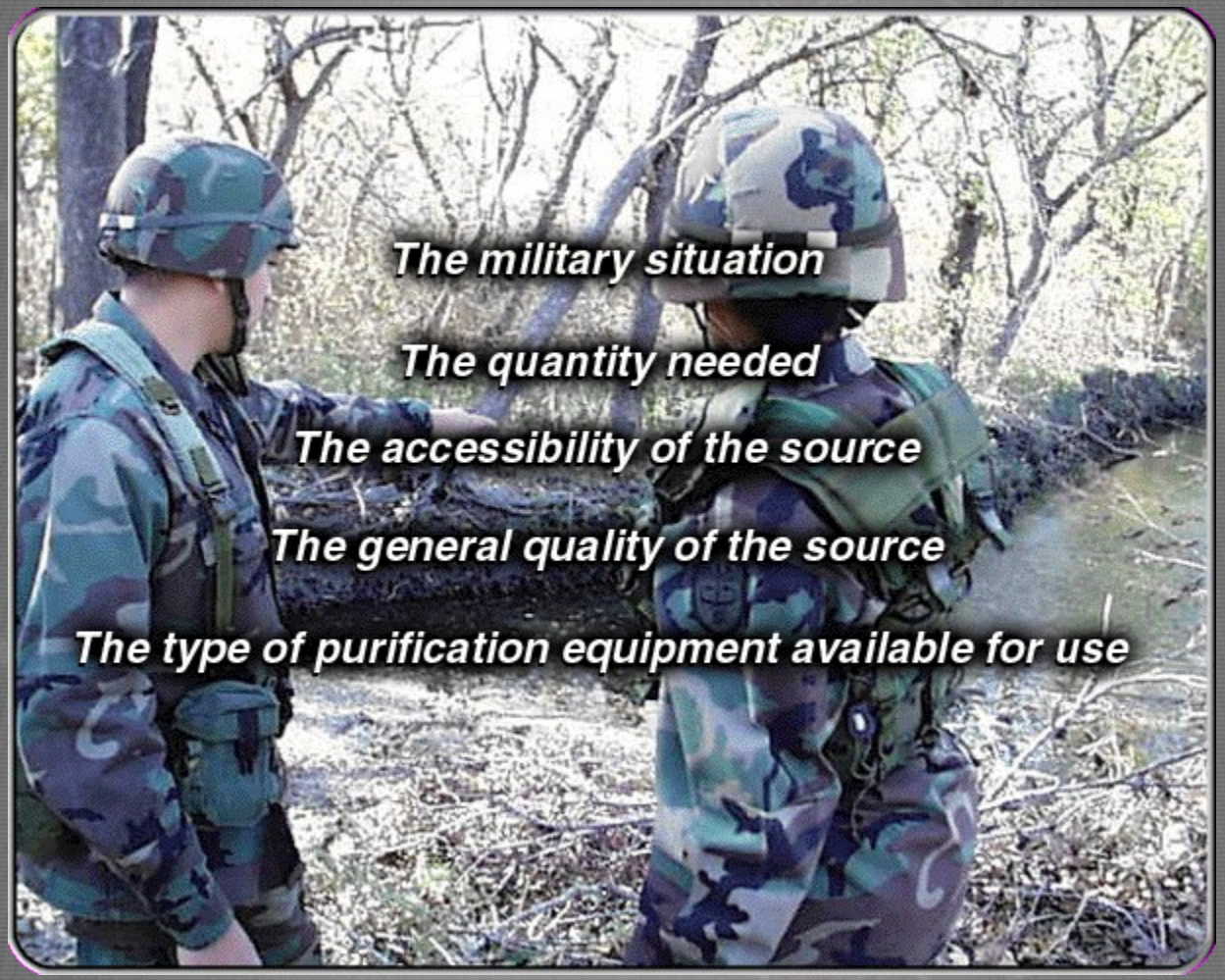
Selecting a Water Source

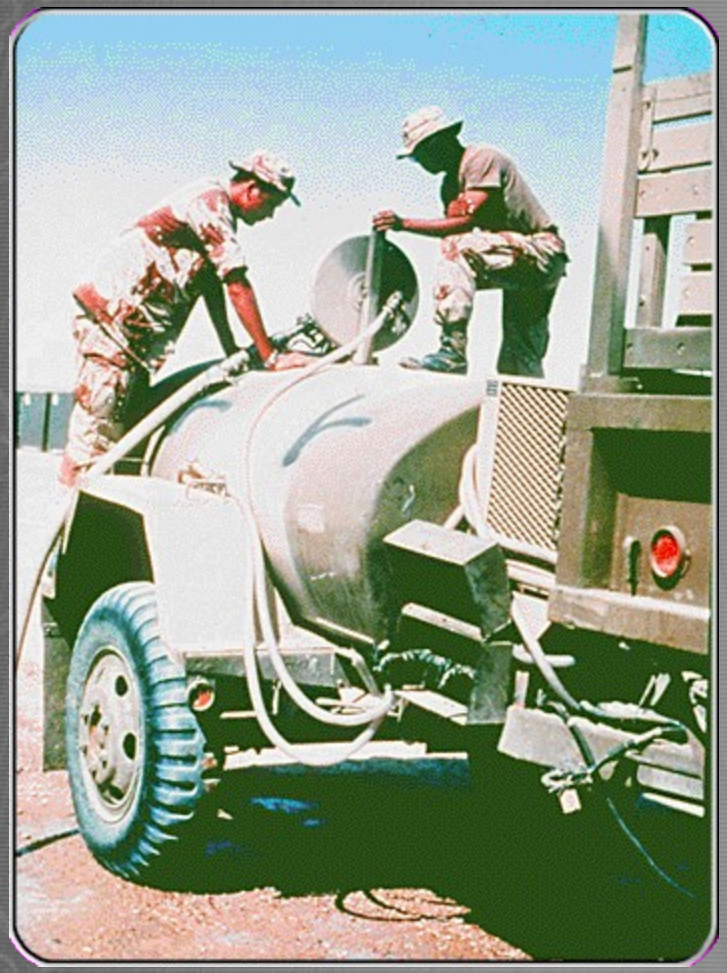

The military situation
The quantity needed
The accessibility of the source
The general quality of the source
The type of purification equipment available for use

- You should consider all these factors when you select a water source.

Water Treatment

- ***The goal of water treatment is to produce potable water.***

Methods of Water Treatment



- Coagulation / sedimentation.
- Filtration.
- Disinfection.

Chemical Water Treatment

- Chlorine treatment.
- Calcium hypochlorite treatment.

Reverse Osmosis Water Purification Units (ROWPU)

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Inspecting the 400-Gallon Water Trailer

- Container.
- Manhole cover.
- Spigots.
- Drains.
- Site.

Interior Surfaces - Stainless Steel / Aluminum

- Inspect interior of a water trailer
  - Seams should be free of rust
  - Interior should be free from paint or other coatings
  - Cracks or dents are OK as long as they don't expose the foam insulation
  - Clean, if necessary, and rinse thoroughly

Potable Water Only

- The words, “Potable Water Only,” should be in plain view.

Manhole Cover

- Check seal, gaskets, locking mechanism, insulation and pressure relief valve.

Dispensing Spigots

- Check T-handle, spigots, protective box, and locks.

Drains

- Should be easy to remove - hand tight only.
- Threads should not be stripped or damaged.

Site Conditions

- *Chlorine residual should be checked immediately upon arrival to the site.*

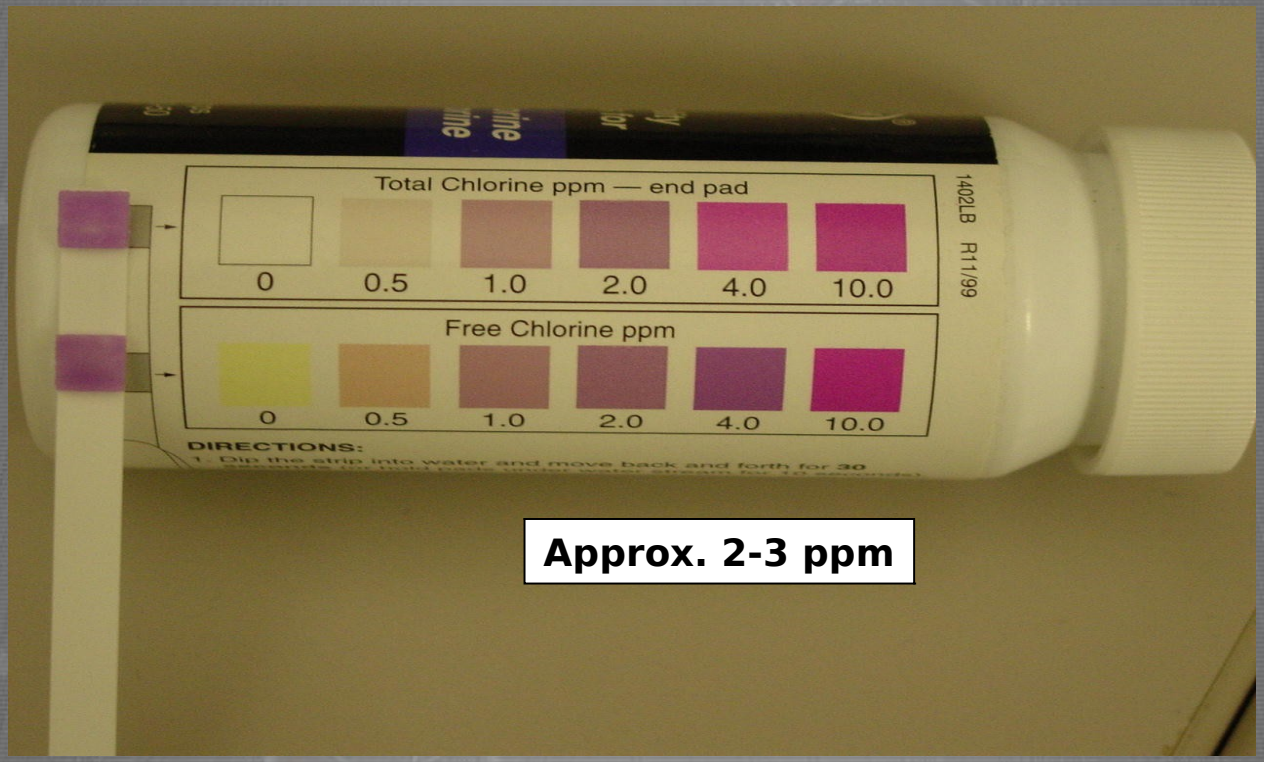
Chlorine Residual Monitoring Kit

- **Components.**
  - 6 oz. Calcium Hypochlorite bottle.
  - Half gram spoon.
  - Chlorine residual test strips.

Procedure for monitoring residual

- Wash your hands.
- Flush the taps of 400-gallon water trailer for several seconds.
- Hold the test strip under water stream for 10 seconds.
- Monitor the color changes carefully.

Monitoring the Chlorine Residual



- ***Compare the free chlorine pads to the color chart on the bottle. Estimate results if the color of the test pad falls between two color blocks.***

Re-chlorinating a Water Buffalo

- Mix 5 half-gram spoonfuls of Calcium hypochlorite from the 6-ounce bottle with one-half canteen cup of water.
- Thoroughly mix the slurry and then add it to the water in the trailer.
- Mix the solution with a clean stick or other clean device and flush the four taps.
- Wait 10 minutes, flush the taps again, and check the chlorine residual.

Re-chlorinating a Water Buffalo

- When chlorine residual reaches 1 ppm, wait 20 minutes and release water.

Re-chlorinating a 5-gallon Water Can

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Re-chlorinating a 5-gallon Water Can

- Add 1 half gram spoonful of calcium hypochlorite to a ½ canteen cup of water and stir the slurry solution.
- Add approximately ½ of the solution to one 5-gallon can.
- Shake the container and wait 10 minutes. Loosen the cap and invert the can to let some treated water flow over the threads of the can.
- Wait an additional 20 minutes, for a total contact time of 30 minutes.

Disinfecting a 1-quart Canteen

- Method #1: Use Iodine Tablets

Disinfecting a 1-quart Canteen with Iodine

- Drop two iodine tablets into a canteen filled with water and wait 5 minutes for the tablets to dissolve.
- Cover the canteen and shake it.
- Loosen the canteen cap and invert the canteen to allow the treated water to flow across the threads of the canteen neck.
- Wait a minimum of 30 minutes before consumption .

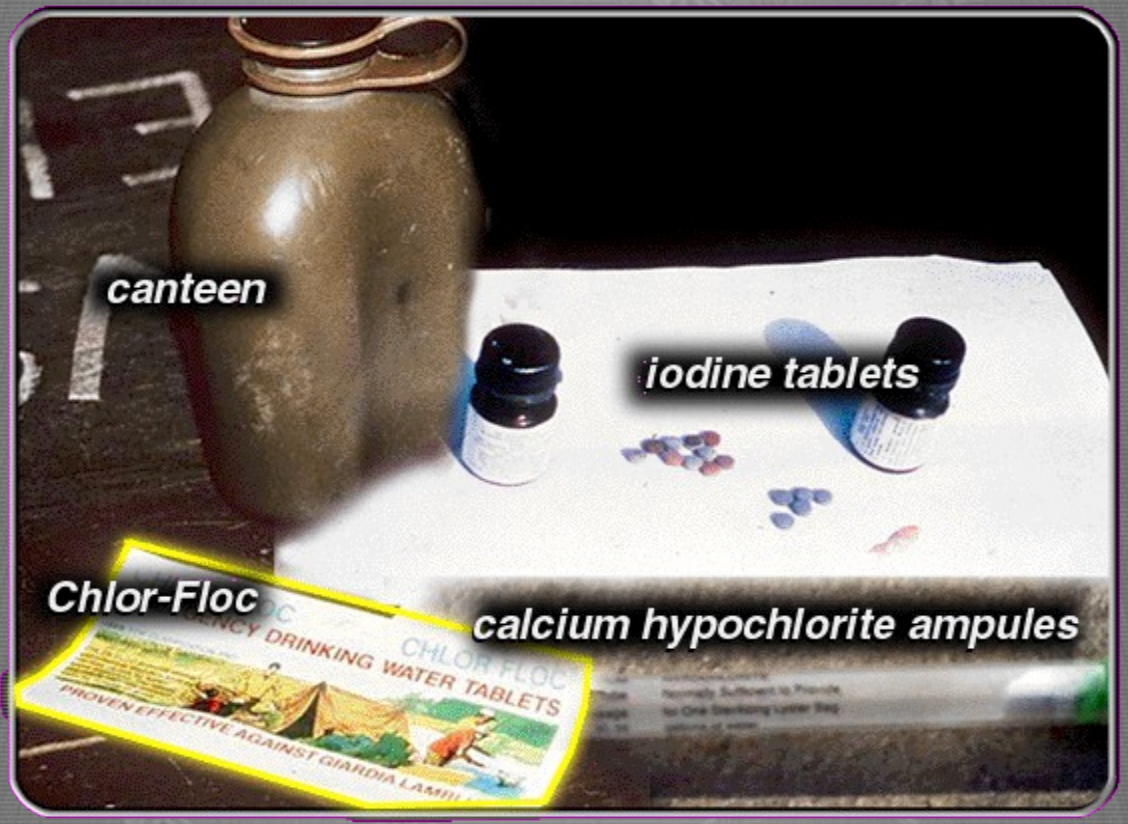
Disinfecting a 1-quart Canteen (2)

- **Method #2: Use Calcium Hypochlorite**

Disinfecting a 1-quart Canteen (2)

- Dissolve the contents of 1 half gram spoon in ½ canteen cup of water to make a slurry.
- Fill an NBC compatible canteen cap or ½ non-NBC cap with the slurry. Pour the cap contents into the canteen and wait 5 minutes .
- Cover the canteen and shake it.
- Loosen the cap and invert the canteen to allow treated water to flow across the threads of the canteen neck.
- Wait a minimum of 30 minutes before consumption.

Disinfecting a 1-quart Canteen (3)



- **Method #3: Use Chlor-Floc**
- **Follow directions listed on the Chlor-Floc package.**

Disinfecting Water by Boiling

- *Use in emergencies ONLY.*
- *Boil water for 5-10 minutes.*

Bottled Water Operations

- *It is important to protect open bottles of water from secondary contamination.*

SUMMARY